Claims

1.   Method of detecting welding process voltage (27), wherein the welding process voltage (27) between a welding torch (10) and a workpiece (16) is detected, characterised in that a calculation of the welding process voltage (27) is performed in real time, taking account of the interference variables of a welding system, in particular an inductance (28) and a resistance (29).

2.   Method as claimed in claim 1, characterised in that the calculated welding process voltage (27) is applied by the control unit (4) to the welding process control.

3.   Method as claimed in claim 1 or 2, characterised in that a calculation process for determining inductance is performed at specific time intervals during a welding process without the welding process being affected.

4.   Method as claimed in one or more of the preceding claims, characterised in that the interference variables, in particular the resistance (29) and/or the inductance (28) of the welding circuit are detected and/or calculated by the control unit (4) before the start of the actual welding process.

5.   Method as claimed in one or more of the preceding claims, characterised in that a voltage and a current at the outputs of the current source (2), in particular at the output terminals (33, 34) of the current source (2), are measured by a measuring device (30).

6.   Method as claimed in one or more of the preceding claims, characterised in that in order to provide a static calculation of the interference variable of the resistance (29) and the inductance (28) of the hose pack (23) and optionally other ohmic interference variables during a secondary short-circuit prior to the start of the welding process, a current change is imposed on a current curve and the measured voltage evaluated.

7.   Method as claimed in claim 6, characterised in that at a predetermined point in time of the current curve, a measurement is taken (4) or the values of the voltage and current detected

at the output terminals (33, 34) of the current source (2) by the control unit are used to calculate the resistance (29).

8.   Method as claimed in claim 6 or 7, characterised in that in order to provide a static calculation of the interference variables, in particular the resistance (29) and the inductance (28) of the hose pack (23), the lines of the hose pack (23) are short-circuited or a short-circuit is produced between the electrode of the welding torch (10) and the workpiece (16) with the supply lines (7) of the hose pack (23) connected thereto, taking account of other interference variables, in particular of the welding torch (10).

9.   Method as claimed in one or more of the preceding claims, characterised in that in order to calculate the interference variables during a welding process for a stable state of the welding process, a balancing pulse is modulated onto or imposed on the welding current, after which the detected values are applied for calculation purposes at fixed points in time.

10.   Method as claimed in one or more of the preceding claims, characterised in that the electrical behaviour of the arc (15), in particular an arc characteristic curve, is incorporated in the process for calculating the interference variables.

11.   Method as claimed in one or more of the preceding claims, characterised in that a process control or a welding process control is performed during the entire pulse duration.

12.   Method as claimed in one or more of the preceding claims, characterised in that the interference variables are calculated by the control unit (2) by means of software using the detected values and a predetermined calculation programme.